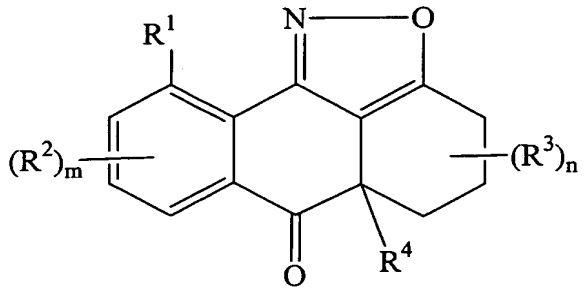
What is claimed is:

1. A production process for producing a polycyclic ketone compound represented by the following Formula (I):



(I)

(wherein R^1 represents a hydrogen atom, a hydroxyl group, a halogen atom, a silyloxy group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted or a C_1 to C_{20} hydrocarbon group which may be substituted;

R^2 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted, a C_1 to C_{10} acyl group which may be substituted, a C_1 to C_{20} hydrocarbon group which may be substituted or a heterocyclic group of a 5- to 7-membered ring which may be substituted or two groups of R^2 form a

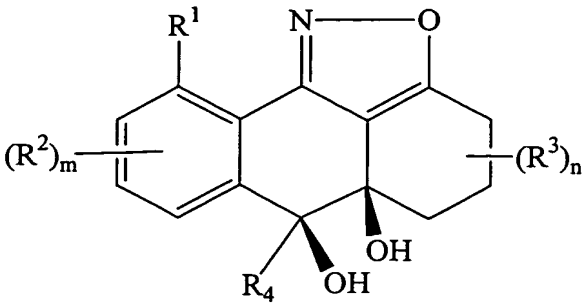
hydrocarbon group of a 4- to 6-membered ring which may be substituted together with adjacent carbon atoms;

R^3 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a C_1 to C_{10} alkoxycarbonyl group which may be substituted or a C_6 to C_{20} hydrocarbon group which may be substituted or two groups of R^3 form a hydrocarbon group of a 4- to 6-membered ring which may be substituted together with adjacent carbon atoms;

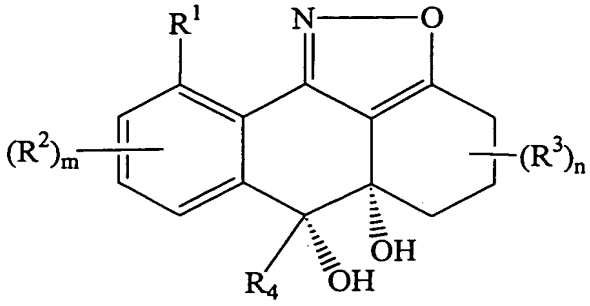
R^4 represents a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted, a C_1 to C_{10} acyl group which may be substituted, a C_1 to C_{10} alkyl group which may be substituted, a phenyl group which may be substituted or a C_1 to C_{20} hydrocarbon group which may be substituted;

m represents an integer of 0 to 3; and n represents an integer of 0 to 6),

wherein a compound represented by the following Formula (IIa) or (IIb) is treated under an acidic condition:



(IIa)



(IIb)

(wherein R^1, R^2, R^3, R^4, m and n are the same as described above).

2. The production process as described in claim 1, wherein the treatment described above is carried out in the presence of a catalyst.

3. The production process as described in claim 1, wherein the catalyst described above is selected from Lewis acids, protonic acids and mixtures thereof.

4. The production process as described in claim 3, wherein the protonic acid described above is selected from mineral acids such as hydrogen chloride, alkanesulfonic acids, carboxylic acids and mixtures thereof.

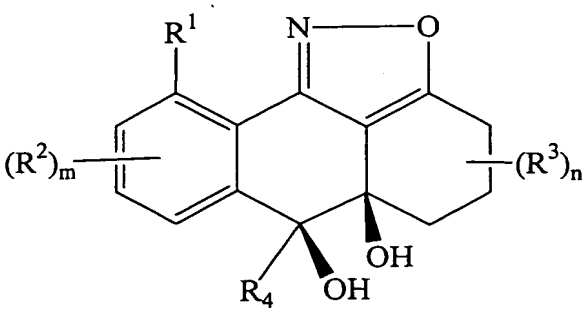
5. The production process as described in claim 1,

wherein the treatment is carried out at a temperature of -78 to 150°C for 0.1 to 50 hours.

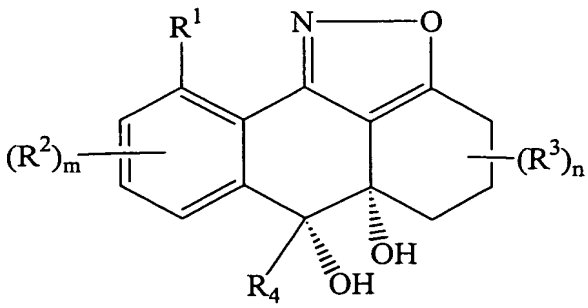
6. The production process as described in claim 1, wherein the treatment is carried out at a temperature of -30 to 40°C for 1 to 20 hours.

7. The production process as described in claim 1, wherein the solvent described above is selected from methanol, ethanol, tetrahydrofuran, diethyl ether, dichloromethane, chloroethylene, dichloroethylene, chloroform, benzene, toluene, acetonitrile, N,N-dimethylformamide and dimethyl ketone, water, 1,4-dioxane, 1,2-dimethoxyethane and mixtures thereof.

8. A production process for producing a compound represented by the following Formula (IIa) or (IIb):

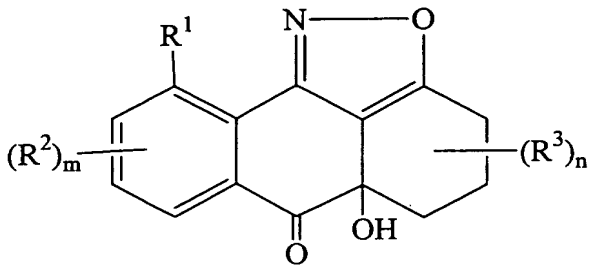


(IIa)



(IIb)

(wherein R^1, R^2, R^3, R^4, m and n are the same as described below) using a production process in which a compound represented by the following Formula (III):



(III)

(wherein R^1 represents a hydrogen atom, a hydroxyl group, a halogen atom, a silyloxy group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted or a C_1 to C_{20} hydrocarbon group which may be substituted;

R^2 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted, a C_1 to C_{10} acyl group which may be substituted, a C_1 to C_{20} hydrocarbon group which may be substituted or a heterocyclic group of a 5- to 7-membered ring which may be substituted or two groups of R^2 form a

hydrocarbon group of a 4- to 6-membered ring which may be substituted together with adjacent carbon atoms;

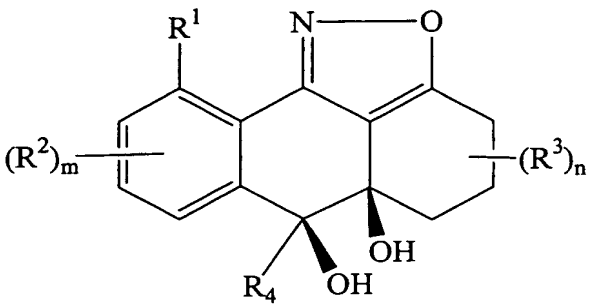
R^3 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a C_1 to C_{10} alkoxycarbonyl group which may be substituted or a C_6 to C_{20} hydrocarbon group which may be substituted or two groups of R^3 form a hydrocarbon group of a 4- to 6-membered ring which may be substituted together with adjacent carbon atoms;

m represents an integer of 0 to 3; and n represents an integer of 0 to 6) is treated under the presence of a compound represented by the following Formula (IV):

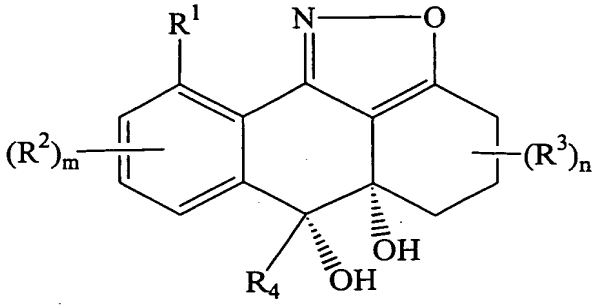
$$R^4\text{-}M \qquad (IV)$$

(wherein M represents metal, and R^4 represents a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted, a C_1 to C_{10} acyl group which may be substituted, a C_1 to C_{10} alkyl group which may be substituted, a phenyl group which may be substituted or a C_1 to C_{20} hydrocarbon group which may be substituted).

9. The production process as described in claim 8, wherein the compound represented by the following Formula (IIa) or (IIb) is obtained in the form of a single isomer:



(IIa)



(IIb)

(wherein R^1, R^2, R^3, R^4, m and n are the same as described above).

10. The production process as described in claim 7, wherein the compound represented by Formula (IIa) or (IIb) (wherein R^1, R^2, R^3, R^4, m and n are the same as described above) described above is produced by treatment carried out at a temperature of -120 to 40°C for 0.01 to 5 hours.

11. The production process as described in claim 8, wherein the compound represented by Formula (IIa) or (IIb) described above (wherein R^1, R^2, R^3, R^4, m and n

are the same as described above) is treated at a temperature of -100 to -20°C for 0.05 to 1 hour.

12. The production process as described in claim 8, wherein in the production of the compound represented by Formula (IIa) or (IIb) described above (wherein R^1, R^2, R^3, R^4, m and n are the same as described above), the solvent described above is selected from methanol, ethanol, tetrahydrofuran, diethyl ether, dichloromethane, chloroethylene, dichloroethylene, chloroform, benzene, toluene, acetonitrile, N,N-dimethylformamide and dimethyl ketone, water, 1,4-dioxane, 1,2-dimethoxyethane and mixtures thereof.

13. The production process as described in claim 1 or 8, wherein R^1 represents a hydrogen atom, a hydroxyl group, a halogen atom, a silyloxy group which may be substituted or a C_1 to C_{10} alkoxy group which may be substituted; R^2 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{20} hydrocarbon group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted or a C_1 to C_{10} acyl group

which may be substituted or two groups of R^2 form a hydrocarbon group of a 5- to 6-membered ring which may be substituted together with adjacent carbon atoms; R^3 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a C_1 to C_5 alkoxycarbonyl group which may be substituted or a C_1 to C_{10} alkyl group which may be substituted or two groups of R^3 form a hydrocarbon group of a 5- to 6-membered ring which may be substituted together with adjacent carbon atoms; R^4 represents a hydrogen atom, a halogen atom, an amino group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted, a C_1 to C_{10} acyl group which may be substituted, a C_1 to C_{10} alkyl group which may be substituted, a C_1 to C_{10} alkenyl group which may be substituted, a C_1 to C_{10} alkynyl group which may be substituted or a phenyl group which may be substituted; M represents metal; m represents an integer of 0 to 2; and n represents an integer of 0 to 4.

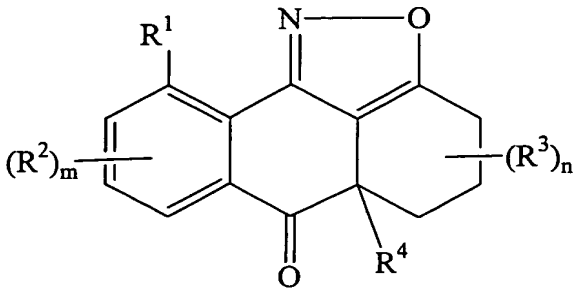
14. The production process as described in claim 1 or 8, wherein R^1 represents a hydrogen atom, a hydroxyl group, a halogen atom, a silyloxy group

which may be substituted, a C_1 to C_5 alkoxy group or a C_1 to C_5 alkoxy C_1 to C_5 alkoxy group; R^2 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{10} alkyl group which may be substituted or a C_1 to C_{10} alkoxy group which may be substituted or two groups of R^2 form a hydrocarbon group of a 6-membered ring together with adjacent carbon atoms; R^3 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group or a C_1 to C_{10} alkyl group which may be substituted or two groups of R^3 form a hydrocarbon group of a 6-membered ring together with adjacent carbon atoms; R^4 represents a hydrogen atom, a halogen atom, an amino group which may be substituted, a C_1 to C_5 alkoxy group which may be substituted, a C_1 to C_5 acyl group which may be substituted, a C_1 to C_5 alkyl group which may be substituted, a C_1 to C_5 alkenyl group which may be substituted, a C_1 to C_5 alkynyl group which may be substituted or a phenyl group which may be substituted; M represents lithium, magnesium, sodium, potassium or zinc; m represents 0 or 1; and n

represents an integer of 0 to 3.

15. The production process as described in claim 1 or 8, wherein R^1 represents a hydroxyl group, a halogen atom, a silyloxy group which may be substituted, methoxy or methoxymethoxy; R^2 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group, a C_1 to C_3 alkyl group or a C_1 to C_3 alkoxy group which may be substituted or two groups of R^2 form a condensed benzene ring together with adjacent carbon atoms; R^3 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group or a C_1 to C_3 alkyl group which may be substituted or two groups of R^3 form a condensed cyclohexyl ring together with adjacent carbon atoms; R^4 represents a C_1 to C_3 alkyl group which may be substituted, a vinyl group, a phenyl group or a tolyl group; M represents lithium; m represents 0 or 1; and n represents 0 or 1.

16. A polycyclic ketone compound represented by the following Formula (I):



(I)

(wherein R^1 represents a hydrogen atom, a hydroxyl group, a halogen atom, a silyloxy group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted or a C_1 to C_{20} hydrocarbon group which may be substituted;

R^2 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted, a C_1 to C_{10} acyl group which may be substituted, a C_1 to C_{20} hydrocarbon group which may be substituted or a heterocyclic group of a 5- to 7-membered ring which may be substituted or two groups of R^2 form a hydrocarbon group of a 4- to 6-membered ring which may be substituted together with adjacent carbon atoms;

R^3 may be independent from each other and the same as

or different from each other and represents a halogen atom, a hydroxyl group, a C_1 to C_{10} alkoxycarbonyl group which may be substituted or a C_6 to C_{20} hydrocarbon group which may be substituted or two groups of R^3 form a hydrocarbon group of a 4- to 6-membered ring which may be substituted together with adjacent carbon atoms;
R^4 represents a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted, a C_1 to C_{10} acyl group which may be substituted, a C_1 to C_{10} alkyl group which may be substituted, a phenyl group which may be substituted or a C_1 to C_{20} hydrocarbon group which may be substituted; m represents an integer of 0 to 2; and n represents an integer of 0 to 4).

17. The polycyclic ketone compound as described in claim 16, wherein R^1 represents a hydrogen atom, a hydroxyl group, a halogen atom, a silyloxy group which may be substituted or a C_1 to C_{10} alkoxy group which may be substituted; R^2 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group which

may be substituted, a C_1 to C_{20} hydrocarbon group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted or a C_1 to C_{10} acyl group which may be substituted or two groups of R^2 form a hydrocarbon group of a 5- to 6-membered ring which may be substituted together with adjacent carbon atoms; R^3 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a C_1 to C_5 alkoxycarbonyl group which may be substituted or a C_1 to C_{10} alkyl group which may be substituted or two groups of R^3 form a hydrocarbon group of a 5- to 6-membered ring which may be substituted together with adjacent carbon atoms; R^4 represents a hydrogen atom, a halogen atom, an amino group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted, a C_1 to C_{10} acyl group which may be substituted, a C_1 to C_{10} alkyl group which may be substituted or a phenyl group which may be substituted; m represents an integer of 0 to 2; and n represents an integer of 0 to 4.

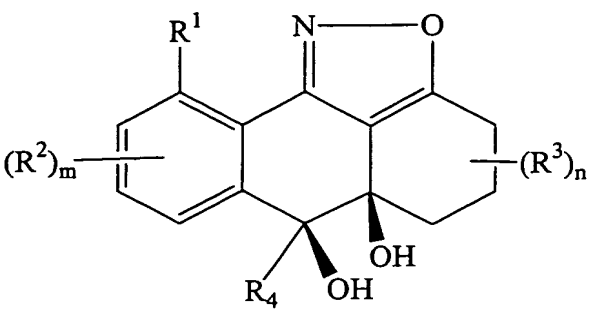
18. The polycyclic ketone compound as described in claim 16, wherein R^1 represents a hydrogen atom, a hydroxyl group, a halogen atom, a silyloxy group

which may be substituted, a C_1 to C_5 alkoxy group or a C_1 to C_5 alkoxy C_1 to C_5 alkoxy group; R^2 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{10} alkyl group which may be substituted or a C_1 to C_{10} alkoxy group which may be substituted or two groups of R^2 form a hydrocarbon group of a 6-membered ring together with adjacent carbon atoms; R^3 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group or a C_1 to C_{10} alkyl group which may be substituted or two groups of R^3 form a hydrocarbon group of a 6-membered ring together with adjacent carbon atoms; R^4 represents a hydrogen atom, a halogen atom, an amino group which may be substituted, a C_1 to C_5 alkoxy group which may be substituted, a C_1 to C_5 acyl group which may be substituted, a C_1 to C_5 alkyl group which may be substituted or a phenyl group which may be substituted; m represents 0 or 1; and n represents an integer of 0 to 3.

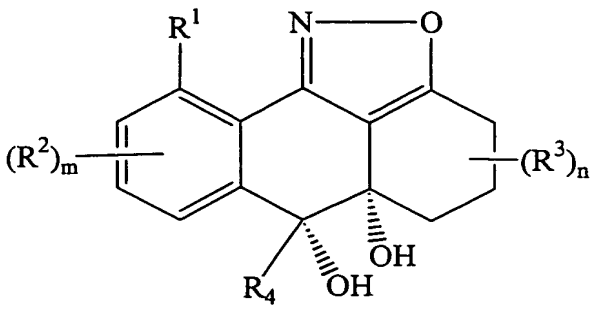
19. The polycyclic ketone compound as described in

claim 16, wherein R^1 represents a hydroxyl group, a halogen atom, a silyloxy group which may be substituted, methoxy or methoxymethoxy; R^2 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group or a C_1 to C_3 alkyl group or a C_1 to C_3 alkoxy group which may be substituted or two groups of R^2 form a condensed benzene ring together with adjacent carbon atoms; R^3 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group or a C_1 to C_3 alkyl group which may be substituted or two groups of R^3 form a condensed cyclohexyl ring together with adjacent carbon atoms; R^4 represents a C_1 to C_3 alkyl group which may be substituted or a tolyl group; m represents 0 or 1; and n represents 0 or 1.

20. A polycyclic compound represented by the following Formula (IIa) or (IIb):



(IIa)



(IIb)

(wherein R^1 represents a hydrogen atom, a hydroxyl group, a halogen atom, a silyloxy group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted or a C_1 to C_{20} hydrocarbon group which may be substituted;

R^2 may be independent from each other and the same as or different from each other and represents a halogen atom, a hydroxyl group, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted, a C_1 to C_{10} acyl group which may be substituted, a C_1 to C_{20} hydrocarbon group which may be substituted or a heterocyclic group of a 5- to 7-membered ring which may be substituted or two groups of R^2 form a hydrocarbon group of a 4- to 6-membered ring which may be substituted together with adjacent carbon atoms;

R^3 may be independent from each other and the same as

or different from each other and represents a halogen atom, a hydroxyl group, a C_1 to C_{10} alkoxycarbonyl group which may be substituted or a C_6 to C_{20} hydrocarbon group which may be substituted or two groups of R^3 form a hydrocarbon group of a 4- to 6-membered ring which may be substituted together with adjacent carbon atoms;

R^4 represents a hydrogen atom, a halogen atom, a cyano group, a nitro group, an amino group which may be substituted, a C_1 to C_{10} alkoxy group which may be substituted, a C_1 to C_{10} acyl group which may be substituted, a C_1 to C_{10} alkyl group which may be substituted, a phenyl group which may be substituted or a C_1 to C_{20} hydrocarbon group which may be substituted; m represents an integer of 0 to 2; and n represents an integer of 0 to 4).